National Infrastructure Modeling & Analysis

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Vision

For Los Alamos to be the center of excellence within the DOE complex for modeling and analysis of the U.S. infrastructures.

- improve existing infrastructure models
- develop models of additional infrastructures
- couple individual infrastructure models

Related TSA-Division Capabilities and Programs

- Infrastructure Assurance Analysis Project
- Urban Security LDRD/CD Program
- Chem/Bio Weapon Nonproliferation Program
- TRANSIMS (Transportation Infrastructure)
- Manufacturing Process Models
- Environmental Security
- Large-Scale, Nonlinear, Complex Modeling
- Economic Modeling

Why Such an Initiative

Security of the U.S. is linked to the reliability, assurance, and protection of our national infrastructure. Recent evidence that infrastructure protection is an important national issue includes:

- President's Commission on Critical Infrastructure Protection
- DOE's Electric System Reliability Task Force
- DoD's Key Asset Protection Program and Critical Asset Assurance Program
- Draft Presidential Decision Directive on Critical Infrastructure Protection
- Several recent activities underscore high-level concern with global warming and its impact on infrastructures

Therefore, such an initiative is appropriate for Los Alamos

Future Plans

Build on existing programs, such as the Infrastructure Assurance Analysis Project, to firmly establish Los Alamos as the leader in the DOE complex for national infrastructure modeling and analysis.

Develop a new program with an environmental slant as part of the GCC initiative.

Participate in the Environmental Security Initiative.

Work with the Delphi team to ensure that National Infrastructure Modeling and Analysis is included.

Evidence that National Infrastructure Modeling & Analysis is an Important National Issue
(and therefore Appropriate for Los Alamos)

President's Commission on Critical Infrastructure Protection
Tasked with developing a strategy for protecting and assuring the continued operation of the US's critical infrastructures. Members include various branches of government.

DOE Electric System Reliability Task Force
Charged with evaluating the reliability of the US's electric power system. Will examine technical, institutional, and policy questions surrounding reliability issues. Reports to the Energy Advisory Board and includes members from industry, universities, government, and public interest groups.

Key Asset Protection Program (KAPP) which has been evolved into the Critical Asset Assurance Program (CAAP)
Considers threats to those infrastructures which are vital to critical military missions and functions.

Draft Presidential Decision Directive on Critical Infrastructure Protection
States the intent of the President to "swiftly eliminate any significant vulnerability to both physical and cyber attacks on our critical infrastructures."

Concern with Global Warming and Its Impact on Infrastructures
Several recent activities in response to the President's challenge for the National Labs to provide information to help develop a Carbon Management Technology Strategy--modeling and analysis was one of the identified needs.

National Infrastructure Modeling & Analysis Thrust Area Fits in Well with Several Current TSA-Division Capabilities and Programs

Infrastructure Assurance Analysis Project (IAAP)
Modeling and analysis of energy infrastructure limitations that potentially impact US military operations.

Urban Security LDRD/CD Program
Developing a cross-divisional complex system competency to assess the response of urban systems to changes in the physical environment, the socio-political setting, and the economy.

Chem/Bio Weapon Nonproliferation Program --Also a Division Thrust Area
Will assess the threat to US infrastructures from the proliferation of chemical and biological weapons of mass destruction, and develop counter measures.

TRansportation ANalysis and SIMulation System (TRANSIMS)--Also a Division Thrust Area
Complex computer simulation of urban transportation at a regional scale that is resolved to the level of individual travel entities.

Manufacturing Process Models
Simulations of various types of manufacturing processes, from nuclear pit to short-sleeved shirts.

Environmental Security
Considers the link (both ways) between national security and environmental issues.

Large-Scale, Nonlinear, Complex System Modeling
Approach uses simulation science techniques to analyze and assess large-scale network systems that are dominated by the interactions of their various components.

Economic Modeling
Division models are used to assess the impact of various changes, such as increased government spending,on local and regional economies.

Progress Since DRC Meeting

Infrastructure Assurance Analysis Project (IAAP)

Modeling and analysis work being performed at Los Alamos is a central part of DoD's Infrastructure Assurance Program. This is part of the larger Critical Asset Assurance Program (CAAP), which is the DoD's implementation program to support the National Critical Infrastructure Program. Los Alamos' budget for FY98 is up to $4.4 million.

Urban Security LDRD/CD Program

Funded for FY98 and FY99, will help develop an approach which will be useful for National Infrastructure Modeling and Analysis.

Environmental Security

Working with STB to be part of the proposed DOE program Global Climate Change program and with EM to develop a proposal as part of the Environmental Security Initiative.

Other

Led the Infrastructure session at the ModSim' 97 USA Workshop, September 22-24, 1997.